SOUTHERN PINE BEETLE

PHEROMONE TRAPPING REPORT, 2021

South Carolina
Forestry Commission

Executive Summary

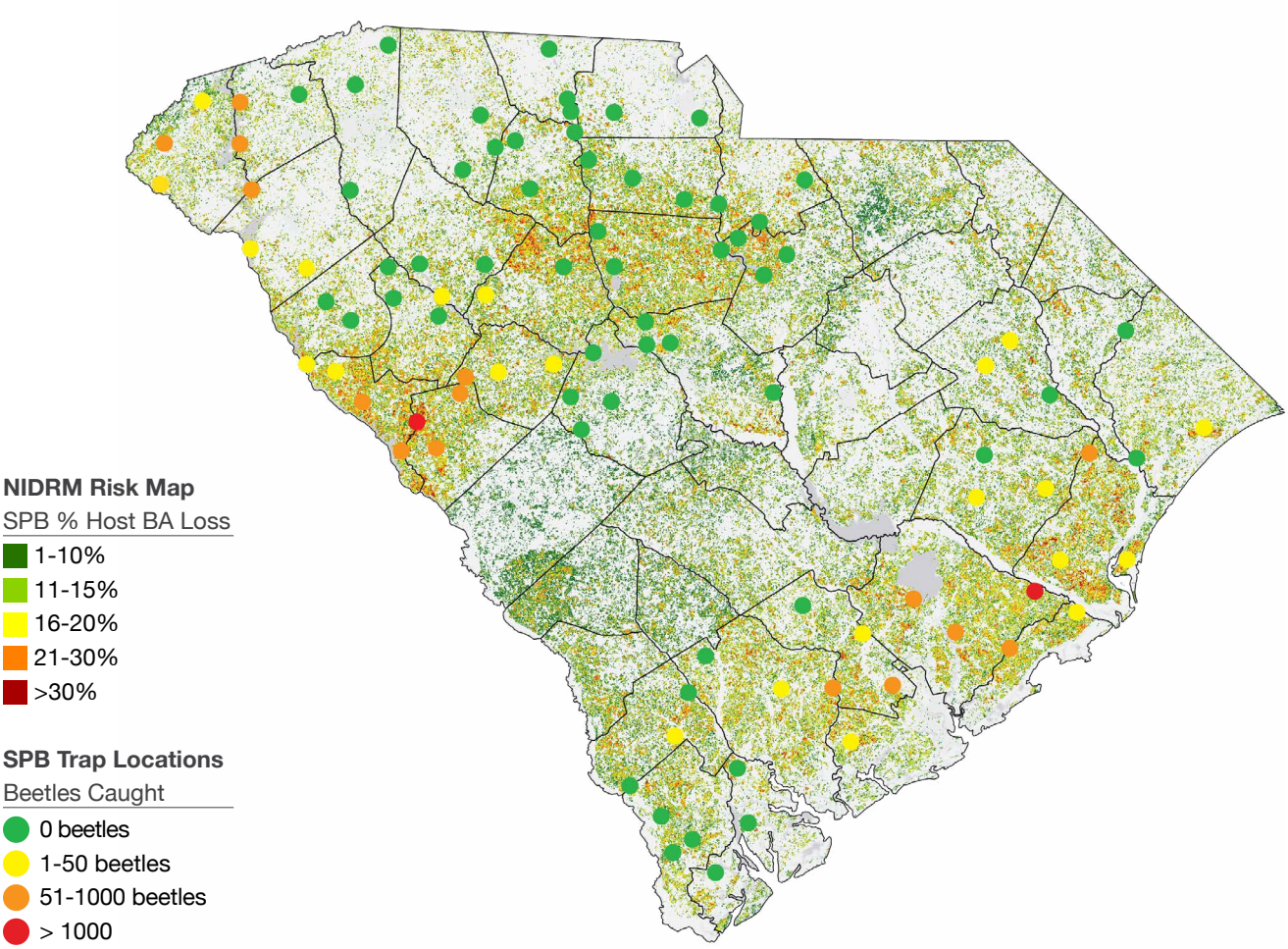
Southern pine beetle (SPB) is one of the most destructive insects to southern yellow pine. The South Carolina Forestry Commission has conducted annual spring pheromone trapping since 1986 to monitor SPB populations and predict the damage they may cause in the upcoming season. Traps were deployed in 32 counties in 2021. Based on the data from these traps we predict static or moderate SPB activity in Edgefield and Berkeley counties. The remainder of the state is predicted to have little significant SPB activity. We do note that SPB was reported in half of the counties trapped, but the increase in clerid predators, warmer weather and increased rainfall predicted over the season by the National Weather Service will likely offset any population growth of SPB.

Introduction and Methodology

A total of 32 SC counties were trapped for SPB in 2021 using revised protocol devised by Billings, et al, 2017. The previous protocol called for two attractants per trap: frontalin and alpha pinene (Sirex lure), and the revised protocol called for an additional third attractant, *endo*-brevicomin, to be placed 10-12' away. In prior studies, the addition of the third attractant has been found on average to be 6.54X more attractive to SPB and .97X less attractive to clerid (SPB's main insect predator) when compared to using frontalin and Sirex lures alone. The SPB Prediction Chart was revised to account for the increased attractiveness to SPB. The protocol includes monitoring three pheromone traps in each county for a 35-day period during early spring. Insects captured in each trap are returned to the laboratory for identification and analysis. The total number of trap days and SPB and clerid beetles caught are summed for each trap. The average number of SPB caught per trap per day and percent SPB are used to predict the population trend for each county and region and for the whole state. In the past, such surveys have had a success rate of over 80% in predicting the degree of SPB infestation for the following summer.

SPB traps were placed in 32 counties in South Carolina in 2021.

South Carolina Forestry Commission Southern Pine Beetle Trapping



Results

Based on these results, we predict Edgefield and Berkeley counties to experience some SPB activity, but their predictions are considered "static and moderate" on the prediction chart. The statewide and regional average predictions remain "declining or low". The statewide SPB caught per trap per day was 2.05 and made up 30% of the total catch. This is approximately equivalent to 2019 (the last year we trapped; 2020 was interrupted due to covid) which was 1.39 and 30%. Piedmont counties caught 55% of the SPB and 89 % of the clerid beetles. The coastal plain caught 45% of the SPB and 11% of the clerid beetles. These results are for entire counties, and there is always the possibility of sporadic and localized beetle activity in counties with overall predictions of low population levels.

Review of 2020

We did not trap in the spring of 2020 due to the covid-19 pandemic. However, the year was mild, temperature-wise and the state received plenty of rain during the growing season. However, the summer of 2019 was hot and large parts of the state (Orangeburg, Lexington, Richland, Kershaw, and Chester counties) experienced severe drought conditions. In the fall of 2019 we saw many *Ips* infestations in the effected counties, some consuming whole acres of pines. Landowners continued to call us about these infestations

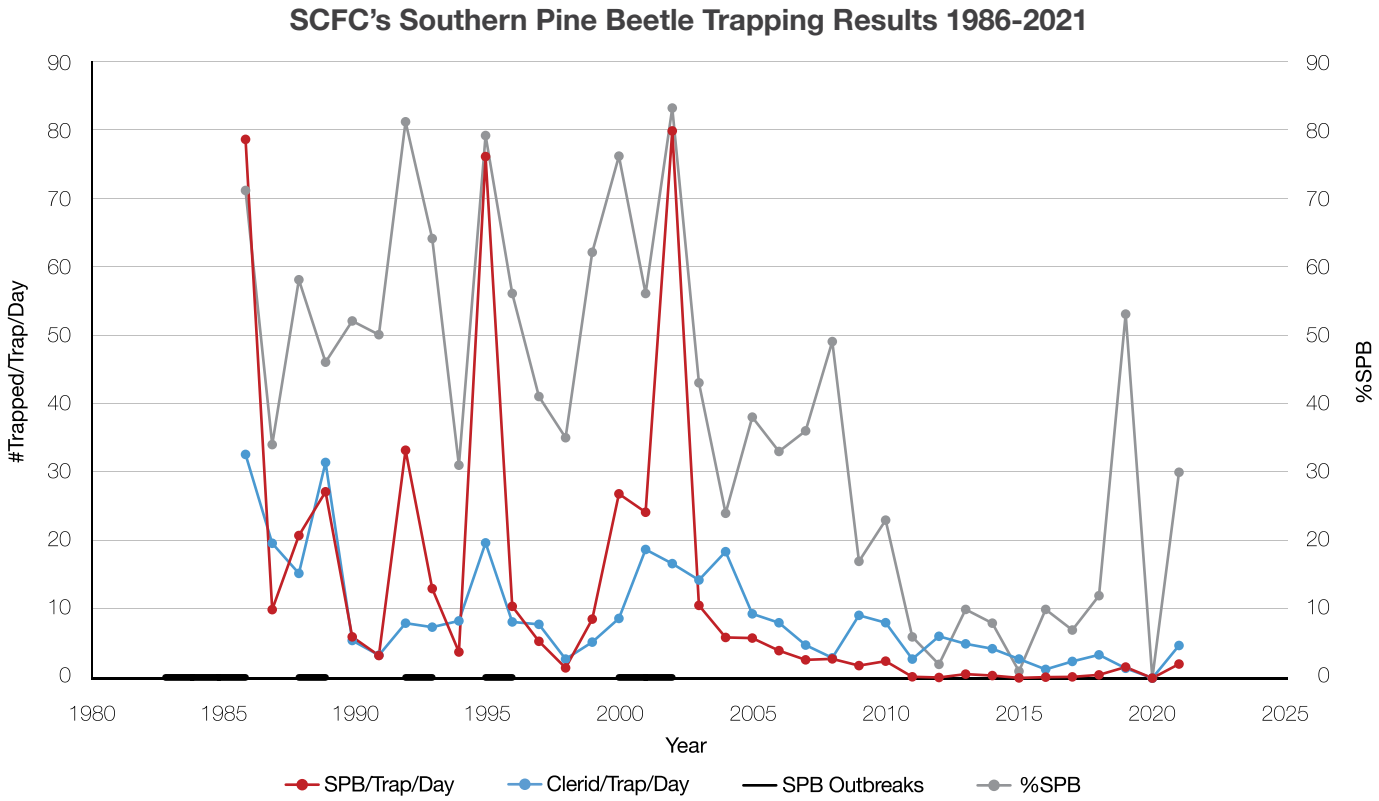
S-shaped egg galleries of SPB.

well into 2020. This uptick in *Ips* activity likely accounts for the increase in clerids we saw this year, the largest number of clerids per trap per day since 2013.

SC's 2021 Bark Beetle Prediction

Predicting SC bark beetle activity for the summer of 2021 is largely based on current and predicted weather, current drought status per region, activity in preceding years, and SC's 2021 pheromone trapping data. For the 2021 summer of the southeastern U.S., the National Weather Service is predicting slightly above average temperatures and above average rainfall. There is currently a drought impacting the Pee Dee and this may cause SPB populations to increase there, but the heat will likely slow them down considerably. Most beetle activity throughout the state of SC are likely to be attributable to *Ips* and Black Turpentine Beetles (BTB) in susceptible pine stands that are overstocked, over-mature or stagnant, have poor or excessive drainage, or have littleleaf, annosus or other root diseases causing stress. *Ips* thrive in stressed trees and high temperatures, completing their life cycle in as little as 21 days. Often, by the time you realize you have an *Ips* spot, they have completed their life cycle and have dispersed. Control tactics employed for SPB, such as "cut and leave" and "salvaging," do not work for *Ips* and BTB since both readily breed in cut pine tops, boles and stumps. During a summer thinning, we recommend all pine tops to be chipped and removed from the site or at least kept at the logging deck. For more information on either beetle, please follow this link: http://www.state.sc.us/forest/idbeetles.pdf

Unlike Ips beetles, SPB attack pines between the bark plates.



* Beginning in 2017 and still in continuation, *endo*-Brevicomin was added to the previous used attractants of Frontalin and Sirex. A study found this new attractant combination on average was 6.54X more attractive to SPB and .97X less attractive to Clerid. To better compare previous years to 2017 and after, the number of SPB Trapped/Trap/Day was divided by 6.54, but the number of Clerid was left the same.

Young, vigorously-growing pines will usually have enough turgor (water pressure) to drown attacking beetles.

SC's SPB Population Trend

SPB activity has leveled out regionally, with SPB spots in Mississippi, Alabama, and Georgia. Populations are increasing marginally in South Carolina.

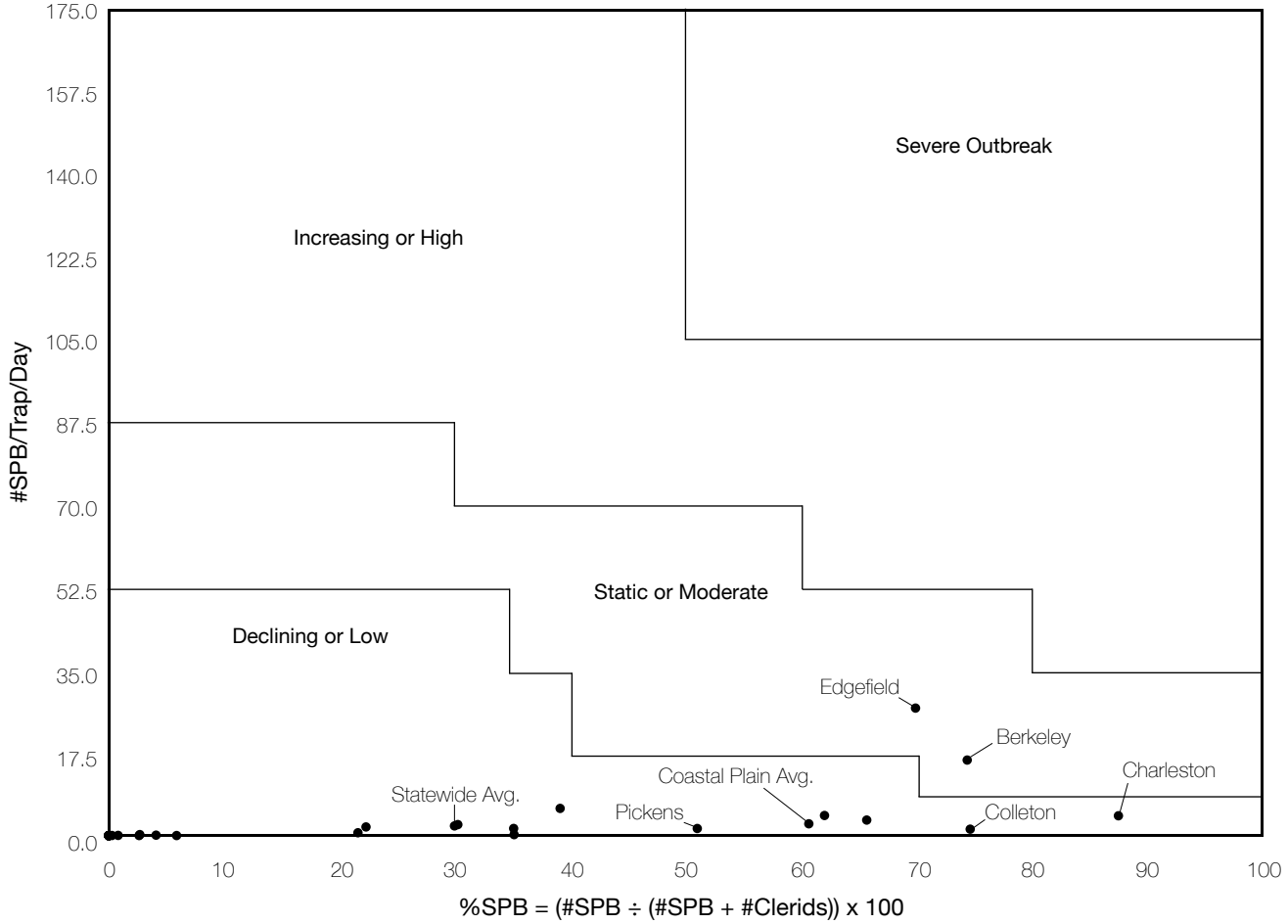
Recommendations for Landowners and Foresters

Although current SPB populations are comparatively low, we encourage foresters and forest landowners to manage for regulated forests by evenly distributing their pine acreage among age classes, thin on a timely basis, and consider harvesting at-risk stands sooner. When regenerating pine stands, it is important to plant the correct species and density for the site, control natural pine regeneration or have a plan in place to address it; and consider available wood markets or lack thereof. The SPB Cost Share Program currently has funds available for regenerating pine stands at lower densities and pre-commercial thinning young, over-dense pine stands. This program is more suited for areas and acreages outside of healthy pulpwood markets which is where we have suffered the most loss to SPB. If interested in applying, please contact your county's SCFC Project Forester.

Summary

We predict that Edgefield and Berkeley counties may experience some SPB activity, with predictions in the "static or moderate" range for both counties. The

SCFC Southern Pine Beetle Pheromone Trapping Survey, 2021
SPB Prediction Chart: Frontalin + Sirex Lure + *endo*-Brevicomin



statewide and regional average SPB predictions are considered "declining–low". High summer temperatures and a rebounding clerid population should restrict SPB dispersal in the state. Most beetle activity within SC will mostly be attributable to *Ips* and BTB. Higher clerid populations and higher than average rainfall that is predicted by the National Weather Service may overcome high summer temperatures and reduce *Ips* and BTB activity in most counties. If you suspect bark beetle activity, please contact the SCFC for identification and the best course of action. Employing the "cut and leave" and "salvaging" techniques could lead to more pine loss if SPB is not the culprit.

It is difficult to predict the degree of loss to SPB and other bark beetles, but our best guess for SC in 2021 is for a loss between one and three hundred thousand dollars.

Contact the SCFC Insect & Disease Staff

Please contact us if you have any questions or if we can provide additional information.

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SCFC Southern Pine Beetle Pheromone Trapping Results, 2021

Severe Outbreak Prediction Trend (1)

No counties in South Carolina are predicted to have a severe outbreak in 2021.

Increasing - High Prediction Trend (2)

No counties in South Carolina are predicted to have an increasing-high outbreak in 2021

Static - Moderate Prediction Trend (3)

County	Trapping Days	#SPB	#Clerids	% SPB	SPB/Day
Edgefield	81	2189	941	69.94%	27.02
Berkeley	84	1391	478	74.42%	16.56

Declining - Low Prediction Trend (4)

County	Trapping Days	#SPB	#Clerids	% SPB	SPB/Day
Abbeville	84	18	651	2.69%	0.21
Anderson	89	207	477	30.26%	2.33
Beaufort	76	0	12	0.00%	0.00
Charleston	97	407	58	87.53%	4.20
Cherokee	144	0	772	0.00%	0.00
Chester	84	0	80	0.00%	0.00
Colleton	87	118	40	74.68%	1.36
Dorchester	81	345	211	62.05%	4.26
Fairfield	87	0	922	0.00%	0.00
Florence	84	3	367	0.81%	0.04
Georgetown	103	62	225	21.60%	0.60
Greenville	88	0	25	0.00%	0.00
Greenwood	96	0	322	0.00%	0.00
Hampton	84	1	19	5.00%	0.01
Horry	92	1	16	5.88%	0.01
Jasper	84	0	48	0.00%	0.00
Kershaw	90	0	630	0.00%	0.00
Oconee	84	276	144	66%	3.29
Pickens	100	150	91	62%	1.50
Lancaster	90	0	1764	0.00%	0.00
Laurens	88	8	195	3.94%	0.09
Lexington	84	0	532	0.00%	0.00
McCormick	75	432	672	39.13%	#DIV/0!
Newberry	81	2	734	0.27%	0.02
Richland	84	0	168	0.00%	0.00
Saluda	110	166	307	35.10%	1.51
Spartanburg	84	0	893	0.00%	0.00
Union	84	0	452	0.00%	0.00
Williamsburg	66	13	24	35.14%	0.20
York	81	0	1,141	0.00%	0.00
State Totals	**2,826**	**5,789**	**13,411**	**30%**	**2.05**
Coastal Totals	**938**	**2,341**	**1,498**	**61%**	**2.50**
Piedmont Totals	**1,888**	**3,448**	**11,913**	**22%**	**1.83**

Severe Outbreak: High probability for major losses
Increasing - High: Greater than 100% increase from previous year
Static - Moderate: Less than a 50% decline to less than 100% increase from previous year
Declining - Low: Greater than a 50% decline from previous year

Cover photo by Erich G. Vallery, USDA Forest Service - SRS-4552, Bugwood.org